Applicant: Sunghwa Choe, et al.

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## In the Claims:

Please amend the claims as follows:

Claims 1-56 (cancelled)

An isolated nucleic acid that encodes a mutant  $\Delta^7$  sterol C-5 desaturase 57. (New) polypeptide, said mutant  $\Delta^7$  sterol C-5 desaturase polypeptide truncated N-terminal to a histidine cluster domain as compared to a wild type  $\Delta^7$  sterol C-5 desaturase polypeptide.

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- The isolated nucleic acid of claim 57, wherein said truncation of said mutant  $\Delta^7$ 58. (New) sterol C-5 desaturase polypeptide occurs at a position N-terminal to the His1 histidine cluster domain as compared to a wild type  $\Delta 7$  sterol C-5 desaturase polypeptide.
- The isolated nucleic acid of claim 57, wherein said truncation of said mutant  $\Delta^7$ 59. (New) sterol C-5 desaturase polypeptide occurs at a position N-terminal to the His3 histidine cluster domain as compared to a wild type  $\Delta 7$  sterol C-5 desaturase polypeptide.
- The isolated nucleic acid of claim 59, wherein said truncation of said mutant  $\Delta^7$ 60. (New) sterol C-5 desaturase polypeptide occurs at a position C-terminal to the His2 histidine cluster domain and N-terminal to the His 3 histidine cluster domain as compared to a wild type  $\Delta 7$  sterol C-5 desaturase polypeptide.
- The isolated nucleic acid of claim 57, wherein said nucleic acid comprises an 61. (New) isolated polynucleotide selected from the group consisting of:
- (a) a polynucleotide consisting of positions 143 to 322 of SEQ ID NO:20;
- (b) a polynucleotide consisting of positions 143 to 1552 of SEQ ID NO:20;
- (c) a polynucleotide having at least 70% identity to (a) or (b); and
- (d) complements of (a), (b), or (c).

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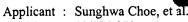
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62. (New) A polynucleotide comprising a control element operably linked to the isolated nucleic acid of claim 57.

- 63. (New) A transgenic plant comprising the polynucleotide of claim 62.
- 64. (New) A host cell comprising the polynucleotide of claim 62.

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- 65. (New) A  $\Delta^7$  sterol C-5 desaturase coding sequence having at least one mutation, said at least one mutation encoding a stop codon, said at least one mutation at a position N-terminal to a histidine cluster domain present in the corresponding  $\Delta^7$  sterol C-5 desaturase wild type coding sequence.
- 66. (New) The  $\Delta^7$  sterol C-5 desaturase coding sequence of claim 65, wherein said at least one mutation is at a position N-terminal to the His1 histidine cluster domain present in the corresponding  $\Delta^7$  sterol C-5 desaturase wild type coding sequence.
- 67. (New) The  $\Delta^7$  sterol C-5 desaturase coding sequence of claim 65, wherein said at least one mutation is at a position N-terminal to the His3 histidine cluster domain present in the corresponding  $\Delta^7$  sterol C-5 desaturase wild type coding sequence.
- 68. (New) The  $\Delta^7$  sterol C-5 desaturase coding sequence of claim 67, wherein said at least one mutation is at a position C-terminal to the His2 histidine cluster domain and N-terminal to the His3 histidine cluster domain present in the corresponding  $\Delta^7$  sterol C-5 desaturase wild type coding sequence.
- 69. (New) The coding sequence of claim 65, wherein said coding sequence comprises an isolated polynucleotide selected from the group consisting of:
- (a) a polynucleotide consisting of positions 143 to 322 of SEQ ID NO:20;
- (b) a polynucleotide consisting of positions 143 to 1552 of SEQ ID NO:20;
- (c) a polynucleotide having at least 70% identity to (a) or (b); and



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(d) complements of (a), (b), or (c).

70. (New) A polynucleotide comprising a control element operably linked to the coding sequence of claim 65.

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- 71. (New) A transgenic plant comprising the polynucleotide of claim 70.
- 72. (New) A host cell comprising the polynucleotide of claim 70.
- 73. (New) A mutant  $\Delta^7$  sterol C-5 desaturase coding sequence that encodes a truncated  $\Delta^7$  sterol C-5 desaturase, said truncated  $\Delta^7$  sterol C-5 desaturase truncated N-terminal to a histidine cluster domain present in the corresponding wild type  $\Delta^7$  sterol C-5 desaturase coding sequence, and said truncated  $\Delta^7$  sterol C-5 desaturase ineffective for catalyzing the desaturation of episterol to 24-methylenecholesterol and campestrol.
- 74. (New) The mutant  $\Delta^7$  sterol C-5 desaturase coding sequence of claim 73, wherein a plant expressing said mutant  $\Delta 7$  sterol C-5 desaturase exhibits an approximately four-fold accumulation in the level of said episterol compared to a corresponding plant expressing a wild type  $\Delta^7$  sterol C-5 desaturase coding sequence.
- 75. (New) A polynucleotide comprising a control element operably linked to the coding sequence of claim 73.
- 76. (New) A transgenic plant comprising the polynucleotide of claim 75.
- 77. (New) A host cell comprising the polynucleotide of claim 75.
- 78. (New) A method of producing a transgenic plant comprising:
- a) introducing the polynucleotide of claim 62 into a plant cell to produce a transformed plant cell; and

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b) producing a transgenic plant from said transformed plant cell.